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Final Lesson II

July 2012

Activity Summary: **In this experiment,** students will learn about the natural recycling system of decomposition, converting organic material into compost. This activity produces nutrient-rich soil and reduces the amount of organic material that needs to be incinerated.

Unit of Study: Earth Materials

Grade Level: 2nd

Adapted from: <http://suite101.com/article/spring-lesson-plans-a14632>

Purpose: This lesson targets several Grade 2 Science Standards as described in the NYS Scope and Sequence regarding Earth Materials. It is also in line with the Elementary Core Curriculum standard regarding The Living Environment. Through direct observation, students will develop an understanding of the effects different organisms, including humans, have on one another. Students will learn, through decomposition, about composting and produce their own nutrient-rich soil.

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| **K-8 Science Scope and Sequence**  **Grade 2**  **Unit 1: Earth Materials** | **Elementary Science Core Curriculum**  **Standard 4: The Living Environment**  Key Idea 1: Living things are both similar to and different from each other and from nonliving things. |
| PS 2.1d Observe and describe the basic properties and components of soil:   * Living components * Nonliving components | 1.1b Plants require air, water, nutrients, and light in order to live and thrive. |
|  | Key Idea 5: Organisms maintain a dynamic equilibrium that sustains life. |
|  | 5.1a All living things grow, take in nutrients, breathe, reproduce, and eliminate waste. |
|  | Key Idea 6: Plants and animals depend on each other and their physical environment. |
|  | 6.1d Decomposers are living things that play a vital role in recycling nutrients. |
|  | 6.1e An organism’s pattern of behavior is related to the nature of that organism’s environment, including the kinds and numbers of other organisms present, the availability of food and other resources, and the physical characteristics of the environment. |

Professional Development Standards (Charlotte Danielson’s Framework for Teaching)

Competency 1e: Designing Coherent Instruction

* Learning activities
* Instructional materials and resources
* Instructional groups
* Lesson and unit structure

Competency 2a: Creating an Environment of Respect and Rapport

* Teacher interaction with students
* Student interaction

Competency 2c: Managing Classroom Procedures

* Management of instructional groups
* Management of transitions
* Management of materials and supplies

Competency 3a: Communicating Clearly and Accurately

* Directions and procedures
* Oral and written language

Competency 3c: Engaging Students in Learning

* Representation of content
* Activities and assignments
* Grouping of students
* Instructional materials and resources
* Structure and pacing

Objectives:

1. Students will **predict what will happen in the two containers (control and experiment) -- one with soil and trash, the other with soil, trash, and worms.**

2. **Students will understand why some people call worms "nature's recyclers."**

3. Students will be able to **discuss how worms can help solve environmental problems.**

Materials (for each group):

1. 1 large plastic container

2. Potting soil

3. Food scraps (fruit and vegetable peelings, breads, beans, crushed eggshells)

4. Dead leaves

5. Earthworms

6. Plastic gloves

7. Rubber cement

8. Black construction paper (to cover the outside of the plastic container)

9. Desk lamp

Materials (for whole class):

1 large plastic container (used for the control)

Lesson Procedure

1. Discuss the recycling plan that exists in the classroom, the cafeteria, and at children’s homes.

2. **Read** Aloud: Compost, By Gosh! Written by Michelle Eva Portman

3. Questions for Discussion:

What is recycling? — Turn and Talk

Explain that today we are going to do a composting activity. Composting is nature's way of recycling.

Why do you think worms are sometimes considered to be nature’s recyclers? — *Turn and Talk*

(Make sure that students understand that worms can turn almost any plant or animal material into new, rich soil that makes great food for a plant.)

4. Have students put on plastic gloves

5. Give each group a plastic container. Have students alternate layers of soil with thin layers of food scraps and dead leaves.

**(Spread about 2 inches of rich soil on the bottom of the container. Spread some common garbage items over the top of the soil. Cover the garbage with two inches of soil.)**

6. Water the soil lightly.

7. Have students take turns putting earthworms into their groups’ container

8. **Create a container without the worms as the control for this experiment.**

9. Have each **student make predictions about what will happen in the two containers over the next couple of weeks and** record what he/she sees in the containers (writing and drawing).

10. Spread rubber cement around the edge of the plastic container, and use it to stick the black construction paper around the sides. The dark paper will prevent light from coming in, which would hold the worms back from going close to the sides of the container.

11. Return one week later. **Observe and compare changes in the control and the worm-filled containers.** Shine light on the top of the soil. This will encourage the worms to bury themselves deeper in the soil.

12. **Return one week later.** Remove the black paper and have each student observe and **compare changes in the control and the worm-filled containers.**

13. Discuss the results of the experiment.

What happened to the trash in the container with the worms in it?

In the container without worms?

How did changes in the two containers differ?

Post Assessment: Each student will write about **why we should compost**.

Students’ understanding will be evaluated when teacher is circulating during the activity using a rubric, for the duration of the pre and post conversations about composting, and when reviewing student experiment sheets.

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| Rubric for “Compost Bin” Activity | | | | |
|  | **4**  **(Above Standard)** | **3**  **(Meets Standard)** | **2**  **(Approaches Standard)** | **1**  **(Far Below Standard)** |
| **Independence** | Student was able to carry-out the activity independently. | Student was able to carry-out the activity with minimal teacher assistance. | Student was able to carry-out the experiment with moderate teacher assistance and prompting. | Student required a great deal of teacher assistance and prompting to carry-out the experiment. |
| **Attention and engagement** | Student remained engaged throughout the activity and was able to assist classmate(s) in need of support. | Student was engaged throughout the activity with no more than one verbal cue to remain on-task. | Student required 2-3 verbal reminders to remain engaged and on- task throughout the activity. | Student required more than 4 verbal reminders to remain on-task throughout the activity. |
| **Student understanding** | Student understands why we should compost and is able to **discuss how worms can help solve environmental problems.** | Student understands why we should compost and **why some people call worms "nature's recyclers."** | Student has an incomplete understanding about why we should compost and why **some people call worms "nature's recyclers."** | Student does not understand why we should compost and why **some people call worms "nature's recyclers."** |